HEWLETT-PACKARD COMPANY
Intellectual Property Administration
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PATENT APPLICATION

ATTORNEY DOCKET NO. 10990989-1

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IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

**Inventor(s):** Carl P. Taussig | **Confirmation No.:** 6159

**Application No.:** 09/716,198 | **Examiner:** A. Psitos

**Filing Date:** Nov. 18, 2000 | **Group Art Unit:** 2651

**Title:** OPTICAL DISK HAVING ZONE CONSTANT ANGULAR VELOCITY WOBBLE

**COMMISSIONER FOR PATENTS**
**Washington, D.C. 20231**

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**TRANSMITTAL OF APPEAL BRIEF**

**Sir:**

Transmitted herewith in **triplicate** is the Appeal Brief in this application with respect to the Notice of Appeal filed on 11/14/2002.

The fee for filing this Appeal Brief is (37 CFR 1.17(c)) $320.00.

**(complete (a) or (b) as applicable)**

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

( ) (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d) for the total number of months checked below:

| | | |
|---|---|---|
| ( ) | one month | $110.00 |
| ( ) | two months | $410.00 |
| ( ) | three months | $930.00 |
| ( ) | four months | $1450.00 |

( ) The extension fee has already been filled in this application.

(X) (b) Applicant believes that no extension of term is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

Please charge to Deposit Account **08-2025** the sum of **$320.00**. At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account 08-2025 pursuant to 37 CFR 1.25. Additionally please charge any fees to Deposit Account 08-2025 under 37 CFR 1.16 through 1.21 inclusive, and any other sections in Title 37 of the Code of Federal Regulations that may regulate fees. A duplicate copy of this sheet is enclosed.

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Typed Name: Hugh P. Gortler

Signature: [signature]

Respectfully submitted,

**Carl P. Taussig**

By [signature]

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Patent
Docket No. 10990989-1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

APPEAL NO. ____________________

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In re Application of:
Carl P. Taussig

Serial No. 09/716,198
Filed: November 18, 2000

For: OPTICAL DISK HAVING ZONE CONSTANT ANGULAR VELOCITY WOBBLE

# APPELLANT'S BRIEF ON APPEAL

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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents Washington, D.C. 20231 on January 8, 2003.

HUGH P. GORTLER, Reg. No. 33,890

INDEX

1. REAL PARTY IN INTEREST

The real party in interest is the assignee, Hewlett-Packard Company.

2. RELATED APPEALS AND INTERFERENCES

Appellant is not aware of any appeals or interferences that would have a bearing on the Board's decision in the pending appeal.

3. STATUS OF CLAIMS

In the office action dated and made final claims 1,3-11, and 13-18 are rejected under 35 U.S.C. §102(b) as being anticipated by Miyamoto et al. because the limitations in these claims are "self-evident." Claims 2, 12, and 19-20 are rejected under 35 U.S.C. §103(a) as being unpatentable over Miyamoto et al in view of Aoki. The Advisory Action affirms these rejections and appears to make an additional rejection over Kobayashi et al. (which was not relied upon in the final office action).

Filed herewith is an amendment, which cancels claims 3 and 9, and amends claim 1 to include the subject matter of these canceled claims. The rejections of claims 1-2, 4-8 and 11-20 are being appealed.

4. STATUS OF AMENDMENTS

An amendment is being filed with this Appeal Brief. The amendment reduces the number of issues for the appeal by adding the limitations of claims 3 and 9 to claim 1; canceling claims 3 and 9; and amending claims 4, 8 and 10 to depend from claim 1 instead of claim 3. The amendment also corrects a typographical error in claim 15, and adds claims 21-26. The pending claims after this amendment are listed in Appendix A.

## 5. SUMMARY OF THE INVENTION

"Read/write" optical disks include optical disks that allow data to be written only once and optical disks that allow data to be written many times. A DVD+RW disk is a type of read/write disk that allows data to be written many times.

When writing data to a read/write optical disk, it is desirable not to create a frequency or phase discontinuity between the data being written ("new" data) and data previously written ("old" data). A read/write drive might not be able to tolerate such discontinuities during readback of the old data and the new data. During readback, the discontinuities can cause problems for read clocks and data recovery circuitry. Consequently, the discontinuities can render portions of the read/write disk effectively unreadable by the read/write drive.

Certain types of overcome the phase/frequency discontinuity problem by performing bit-accurate or linkless editing, whereby new blocks of data are written with negligible frequency or phase discontinuity with respect to adjacent blocks of old data. This bit-accurate editing is accomplished by exploiting accurate timing information embossed in a high frequency wobbled groove in the read/write disk. The bit-accurate editing eliminates the need for edit gaps.

When writing new data to a read/write disk, a bit-accurate read/write drive modulates the wobbled shape of the groove to generate a raw wobble signal. A wobble clock may be generated by a phase locked loop (PLL) that is locked to a harmonic of the raw wobble signal. The wobble clock provides an extremely accurate time reference.

The groove may have a constant angular velocity (CAV) wobble or a constant linear velocity (CLV) wobble. The CAV wobble reduces jitter during playback of the disk.

However, the jitter can still occur during playback of a CAV optical disk. The jitter reduces signal-to-noise ratio, which, in turn, increases readback error and thereby increases the burden on error code correction.

The present invention addresses the problem of jitter in CAV disks. The applicant has found that the jitter occurs because there is not perfect phase (or perfect anti-phase) alignment of the wobbles along a radial in a zone. As stated at page 2, lines 28+ of the application, period and spatial relation of wobble cycles of the groove are selected to reduce jitter during readback of data stored on the disk. Reducing the jitter increases the signal-to-noise ratio, which, in turn, lessens the burden on error code correction. Resulting is a greater capability to handle other disturbances (e.g., mechanical disturbances, disturbances due to media defects) to the readback channel.

Reference is made to Figures 1-2 of the application (which are attached hereto as Appendix B). Claim 1 recites an optical storage medium (10) comprising a recordable medium; and a groove (12) in the recordable medium (page 3, lines 4-7). The groove has a constant angular velocity wobble (page 3, line 21). Wobble cycles (13) of the groove (12) form a plurality of concentric zones (ZB) (page 3, lines 24-27). Wobble cycles (13) in the same zone are spatially coherent (page 4, lines 2-23).

Claim 11 recites an optical storage medium comprising a recordable medium (10); and a groove (12) in the recordable medium, the groove having a plurality of wobble cycles (13) that form a plurality of concentric zones (ZB). Wobble cycles (13) in the same zone subtend the same angle ($\theta_1$), and wobble cycles (13) in different zones subtend different angles ($\theta_2$) (page 3, line 28 to page 4, line 3 ).

Claim 19 recites an optical disk (10) comprising a recordable medium; and a groove (12) in the recordable medium. The groove (12) has a plurality of wobble cycles (13) that form a plurality of concentric zones. Wobble cycles in the same zone subtend the same angle, and wobble cycles in different zones subtend different angles. The wobble cycles are BPSK-modulated (page 3, lines 12-20).

6. THE ISSUES

a. Whether the documents made of record teach a CAV disk having a groove with wobble cycles that are spatially coherent in the same zone.

b. Whether the documents made of record teach or suggest a CAV disk in which wobble cycles in the same zone subtend the same angle, and wobble cycles in different zones subtend different angles.

c. Whether the documents made of record teach or suggest BPSK-modulation of a CAV wobbled groove of an optical disk.

7. GROUPING OF CLAIMS

Claims 1, 4-8, 10, and 17-18 stand or fall together with respect to issues a.

Claims 11 and 13-18 stand or fall together with respect to issues b.

Claims 2, 12, and 19-20 stand or fall together with respect to issue c.

## 8. ARGUMENTS

### I
### THE '102 REJECTIONS OF CLAIMS 1, 4-8, 10 AND 17-18 SHOULD BE WITHDRAWN BECAUSE THE DOCUMENTS MADE OF RECORD DO NOT DISCLOSE A CONSTANT ANGULAR VELOCITY DISK HAVING SPATIALLY COHERENT WOBBLE CYCLES IN THE SAME ZONE

Miyamoto et al. do not teach or suggest a groove having a constant angular velocity wobble. Miyamoto discloses a constant linear velocity (CLV) system (col. 2, lines 41-45). The system includes a disk having a spiral-like groove that is wobbled (col. 4, lines 44-47). The wobble is used to control the rotational speed of the optical disk in such a manner that the cycle of the detected wobbling signal becomes constant (col. 3, lines 48-55; col. 4, lines 58-60; col. 13, lines 13-17). When the wobbling frequency becomes constant, "it becomes possible to make a relative linear velocity between the beam spot and the information recording medium almost constant independent of the position of the information recording medium" (col. 15, lines 19-22).

Moreover, Miyamoto et al. do not teach any sort of phase relationship between wobble cycles, let alone wobble cycles that are spatially coherent. The specification of Miyamoto et al. is silent; it discusses wobble cycle length but not the spatial relationship of wobble cycles on different tracks. Figures 1 and 5 of Miyamoto et al are sketchy and don't clearly establish any sort of phase relationship between wobble cycles of a CLV disk, let alone a CAV disk (Figures 1 and 5 are attached as Appendix C).

In contrast, Figure 2 of the application (attached as Appendix B) clearly shows wobble cycles in the lower zone having perfect in-phase alignment along a radial $R_L$, and wobble cycles in the upper zone having perfect in-phase alignment along a radial $R_U$ (Figure 2 has been annotated to denote the upper and lower zones, and the radials $R_L$ and $R_U$).

## III

## THE '103 REJECTIONS OF CLAIMS 2, 12, 19 AND 20 SHOULD BE WITHDRAWN BECAUSE THE COMBINATION OF MIYAMOTO ET AL. AND AOKI DO NOT PRODUCE A CONSTANT ANGULAR VELOCITY DISK HAVING A GROOVE WITH BPSK-MODULATED WOBBLE

Claims 2, 12, 19 and 20 recite a constant angular velocity disk having a groove, the wobble of which is BPSK-modulated for providing address information. Signal-to-noise ratio of the address information is increased because the length and frequency of the BPSK symbols are increased.

Miyamoto et al. do not disclose a constant angular velocity disk for the reasons stated in Argument I. Moreover, Miyamoto et al. disclose prepits for generating address information (col. 11, lines 23-25).

Aoki does not teach or suggest BSPK-modulating a CAV wobbled groove of an optical disk. It appears to suggest modulating a CLV wobbled groove of a compact disk (see col. 1, lines 23-55). However, as stated on page 7, lines 20+ of the present application,

> If a CLV wobbled groove was BPSK-modulated, radially adjacent tracks would create a phase disturbance with the track being sensed. The frequency of this phase disturbance would depend upon the address data and the address bit length. The effect of the wobble phase modulation on the quality of the playback data would be determined by the characteristics of the read and wobble PLLs. (The disturbance would come from the superposition of the signals from the center and adjacent tracks. Although phase and amplitude are modulated, only the phase modulation matters. The write clock mostly tracks the disturbance and writes the disturbance into the data. The read clock mostly follows the written-in disturbance, but not completely. Therefore, a phase error or "jitter" results.)

Thus, the proposed modifications would render the prior art unsatisfactory

for its intended purpose. However, MPEP 2143.01 states that "if the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification." Therefore, the examiner has not established prima facie obviousness of claims 2, 12 and 19-20.

Moreover, Aoki does not suggest the desirability of modifying the wobble of a CAV disk. MPEP 21403.01 states that the "fact that references can be combined or modified is not sufficient to establish prima facie obviousness." The resultant combination is not rendered obvious "unless the prior art suggests the desirability of the combination." A lthough a prior art device may be capable of being modified to in the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so.

The examiner states that the combination of Miyamoto et al. and Aoki is obvious simply because the benefits of Aoki are obvious. However, the examiner does not establish that the so-called benefits also apply to a CAV disk. Moreover, Aoki is oblivious to the problems of jitter in a CAV disk. The solution to the problem of jitter is not obvious.

For the additional reason that Miyamoto et al. and Aoki do not teach or suggest the desirability of BPSK-modulation of a CAV wobbled groove of an optical disk, the '103 rejections of claims 2, 12, 19 and 20 should be withdrawn.

## 9. CONCLUSION

Thus far, the examiner argues that all but four claims are anticipated because their limitations are self-evident. The first office action said no more than that. In response, the undersigned provided a detailed traverse of the rejections, with pinpoint cites to the cited documents. The response also requested the examiner to explain why the claim limitations were self-evident. .

The second office action offered little more guidance. The examiner basically affirmed his rejections that the limitations are self evident, and he pinpointed his arguments to the entire specification and claims of Miyamoto et al.

The Advisory Action gave a little more detailed explanation as to why claim 1 was anticipated, but did so by citing a document (Kobayashi) that was not relied upon in the previous two office actions. The Advisory Action did not explain why the other claims were anticipated.

The MPEP states that the examiner has the burden of establishing prima facie anticipation. Stating that limitations are self-evident improperly shifts this burden to the applicant. It also requires the applicant and his attorney to engage in mind reading by trying to figure out what the examiner had in mind when he made the rejections.

The MPEP states the "goal of examination is to clearly articulate any rejection early in the prosecution process so that the applicant has the opportunity to provide evidence of patentability and otherwise reply completely at the earliest opportunity." The examiner ignores this goal by resting on a bald allegation that claim limitations are self-evident.

The applicant is entitled to a fair examination of his application. He has yet to receive one. Therefore, the undersigned turns to the Honorable Board of Patent Appeals and Interferences.

The arguments above establish that the rejections of claims 1-2, 4-8, and 11-20 should be withdrawn. Appellant respectfully requests the Honorable Board of Patent Appeals and Interferences to reverse these rejections.

Respectfully submitted,

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10. APPENDIX

Appendix A. The Claims on Appeal

1. An optical storage medium comprising:

a recordable medium; and

a groove in the recordable medium, the groove having a constant angular velocity wobble, wherein wobble cycles of the groove form a plurality of concentric zones and wherein wobble cycles in the same zone are spatially coherent.

2. The medium of claim 1, wherein the wobble of the groove is BPSK-modulated for providing address information.

4. The medium of claim 1, wherein the wobble cycles in the same zone subtend the same angle; and wherein the wobble cycles in different zones subtend different angles.

5. The medium of claim 4, wherein average spatial period of a wobble cycle in a zone is an integer multiple of channel bit length.

6. The medium of claim 5, wherein maximum deviation of the wobble spatial period in each zone is the same fixed percentage.

7. The medium of claim 4, wherein wobble cycle period is stepped from zone-to-zone.

8. The medium of claim 1, wherein the groove has the same number of wobble cycles as a groove having CLV wobble.

10. The medium of claim 1, wherein wobble cycles in the same zone are completely out-of-phase.

11. An optical storage medium comprising:

a recordable medium; and

a groove in the recordable medium, the groove having a plurality of wobble cycles that form a plurality of concentric zones, wobble cycles in the same zone subtending the same angle, wobble cycles in different zones subtending different angles.

12. The medium of claim 11, wherein the wobble of the groove is BPSK-modulated for providing address information.

13. The medium of claim 11, wherein average spatial period of the wobble cycles in the zones are integer multiples of channel bit length.

14. The medium of claim 11, wherein maximum deviation of wobble spatial period in each zone is the same fixed percentage.

15. The medium of claim 11, wherein wobble cycle period is stepped from zone-to-zone.

16. The medium of claim 11, wherein the groove has the same number of wobble cycles as a groove having CLV wobble.

17. The medium of claim 11, wherein the wobble cycles in the same zone are spatially coherent.

18. The medium of claim 11, wherein the wobble cycles in the same zone are completely out-of-phase.

19. An optical disk comprising:

a recordable medium; and

a groove in the recordable medium, the groove having a plurality of wobble cycles that form a plurality of concentric zones, wobble cycles in the same zone subtending the same angle, wobble cycles in different zones subtending different angles, the wobble cycles being BPSK-modulated.

20.The disk of claim 19, wherein the groove has the same number of wobble cycles as a CLV wobble groove.

21. The medium of claim 1, wherein wobble cycles on at least two adjacent tracks are spatially coherent.

22. The medium of claim 7, wherein each zone includes a plurality of tracks.

23. The medium of claim 1, wherein the optical storage medium is a DVD disk.

24. The medium of claim 11, wherein wobble cycles on at least two adjacent tracks are spatially coherent.

25. The medium of claim 15, wherein each zone includes a plurality of tracks.

26. The disk of claim 19, wherein the disk is a DVD disk.

## APPENDIX B

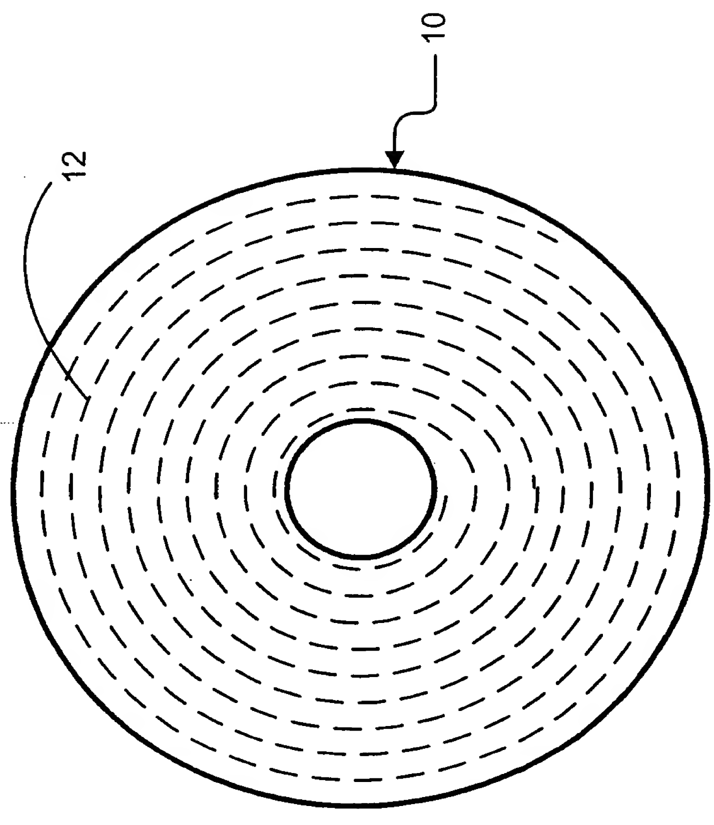



FIG. 1

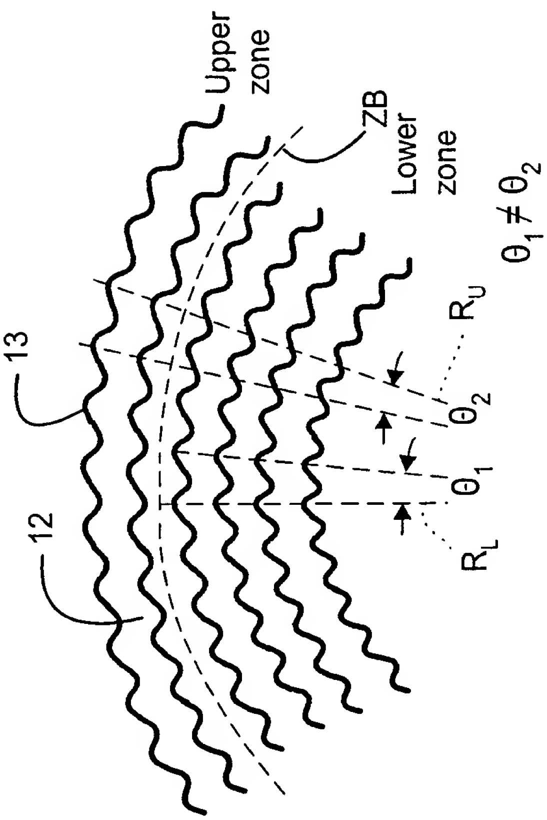



FIG. 2

FIG. 1

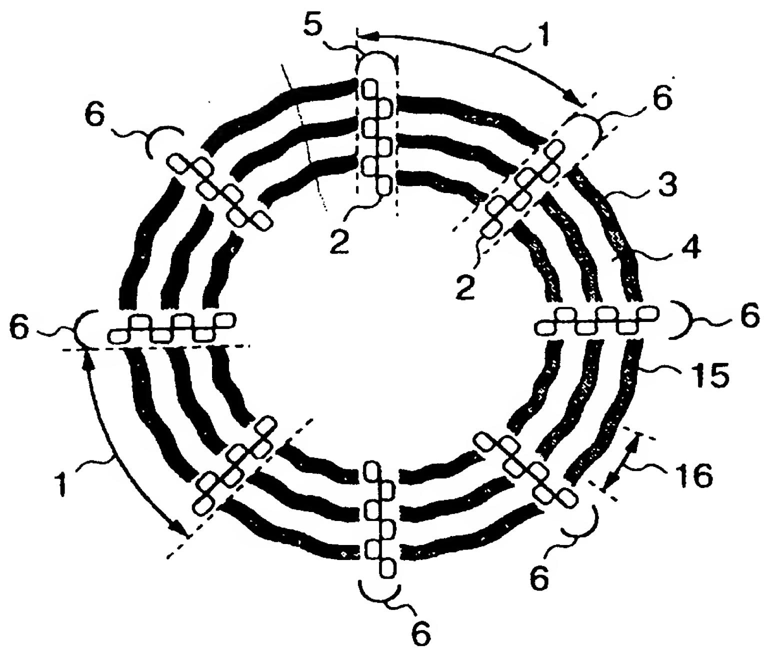
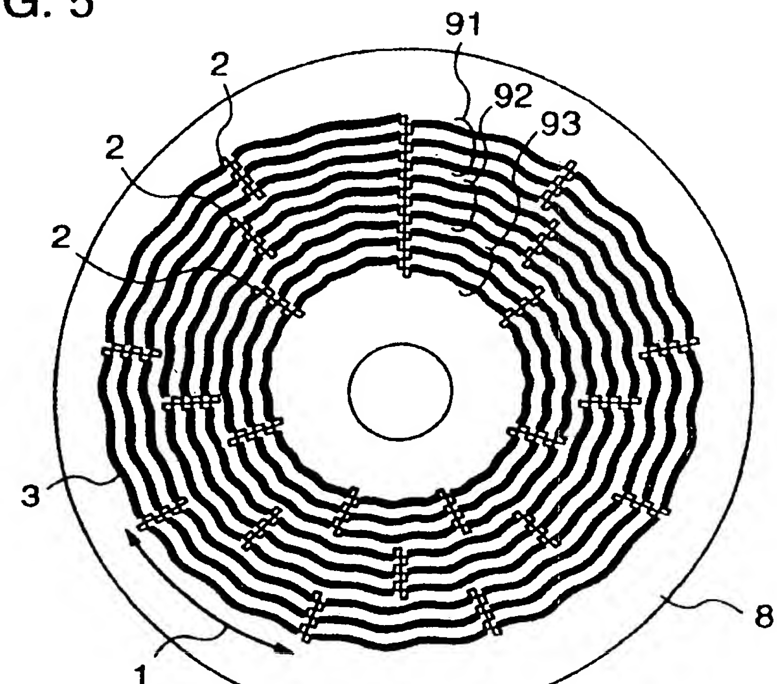





FIG. 5



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